

Measuring Satisfaction with Mammography Results Reporting

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OBJECTIVE: To assess factors associated with patient satisfaction with communication of mammography results and their understanding and ability to recall these results.

DESIGN: Cross-sectional telephone survey.

SETTING: Academic breast imaging center.

PATIENTS: Two hundred ninety-eight patients who had either a screening or diagnostic mammogram.

MEASUREMENTS AND MAIN RESULTS: Survey items assessed waiting time for results, anxiety about results, satisfaction with several components of results reporting, and patients' understanding of results and recommendations. Women undergoing screening exams were more likely to be dissatisfied with the way the results were communicated than those who underwent diagnostic exams and received immediate results (20% vs 11%, $P = .05$). For these screening patients, waiting for more than two weeks for notification of results, difficulty getting in touch with someone to answer questions, low ratings of how clearly results were explained, and considerable or extreme anxiety about the results were all independently associated with dissatisfaction with the way the results were reported, while age and actual exam result were not.

CONCLUSIONS: Patients undergoing screening mammograms were more likely to be dissatisfied with the way the results were communicated than were those who underwent diagnostic mammograms. Interventions to reduce the wait time for results, reduce patients' anxiety, and improve the clarity with which the results and recommendations are given may help improve overall satisfaction with mammography result reporting.

KEY WORDS: mammography; satisfaction; doctor-patient communication; test results.

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Previous studies indicate that experiences of pain, discomfort, and distress undermine women's decisions to undergo repeat screening mammography.^{1,2} In addition, to the extent that women hear about mammography services through friends and neighbors, a woman's satis-

faction with her mammography experience may also affect whether or not her family and friends undergo mammography or attend a selected mammography center.

Components of patients' satisfaction with mammography include satisfaction with convenience/acceptability, physical surroundings, staff interpersonal skills, perceived technical competence, and transfer of information.³ Of these, information transfer, and more specifically, the way results are reported to the patient, has been associated with the most dissatisfaction.¹ This dissatisfaction, as well as concerns about the reliability and the timeliness with which patients receive mammogram results, are some of the contributing factors that led to the Mammography Quality Standards Act; Final Rule, federal legislation mandating that all mammography centers provide women with clear, written notification of their results and recommendations.⁴

This report focuses on women's satisfaction with communication of mammography results and follow-up recommendations at one institution, prior to the implementation of the Mammography Quality Standards Act on April 28, 1999. We summarize the results of a telephone survey of 298 women undergoing screening and diagnostic mammography at an academic breast-imaging center in April 1999. The purposes of the study were 1) to describe satisfaction with communication of results among patients with documented normal and abnormal screening and diagnostic mammogram results; 2) to measure the effect of patient age, mammography results, time it took to receive the results, patient reported anxiety about the results, and satisfaction with components of communication of results (staff and physician time spent communicating, clarity of explanation, comfort level, access, and how well questions were answered) on overall satisfaction with results reporting; and 3) to evaluate patients' understanding of their mammogram results and recommendations by determining the prevalence of inability to recall results and recommendations and rates of discordance between patient-reported results and follow-up recommendations and the results and recommendations documented in radiology reports.

METHODS

Current Practices

During the study period, screening and diagnostic mammograms were performed at two locations, located one block apart. Both, however, were part of same mammography center with centralized results reporting. The

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mammography center mailed written mammography results and recommendations to the referring physician for all cases. Women with normal screening mammograms were generally notified of the results by their referring physician. Women with abnormal screening mammograms requiring immediate follow-up were also called directly by the mammography center to schedule a diagnostic exam, which would generally include follow-up ultrasound testing if indicated. Except under unusual circumstances, all women who had diagnostic appointments were verbally informed of their results and recommendations directly at the mammography center at the time of their exams.

Telephone Interview

During a 10-day period in April 1999, study site receptionists gave all female patients presenting for a mammogram an Institutional Review Board (IRB)-approved informational letter describing the study. Women were asked to indicate refusal to participate in the study at that time by signing and returning the study description letter. Consenting diagnostic exam patients were called within three days of a two-week interval after the date of their mammogram. Screening exam patients with abnormal results were interviewed within three days of a three-week interval after their index exam date and normal screening exam patients were interviewed within three days of a four-week interval after their index exam date. Different time intervals were chosen to allow ample time for the women to have received their results, thus minimizing any anxiety potentially created by calling women who had not yet received their results.

Survey Items

Survey items were written by study investigators to measure the following constructs: waiting time for results, satisfaction with result reporting, recollection of follow-up recommendations, and anxiety about the results. Because of the differences in mammography center test reporting practices for different exam types, it was necessary to include several distinct items in versions of the survey administered to diagnostic exam patients as compared to screening patients. The initial survey was reviewed for content validity by radiology and internal medicine investigators. A revised version was pilot tested on six past and current mammogram patients. The final survey included 12 to 17 items, depending on mammography type and took approximately 5 to 10 minutes to complete.

Telephone interviewers, all women, underwent a 1½-hour training session prior to the initiation of the survey. Interviewers were trained by study investigators to clearly focus on the index mammogram appointment for any patients who had undergone multiple mammograms before being interviewed. While respondents' age and exam category were provided, the interviewers were blinded to respondents' actual test results.

Sampling

A computerized exam registry of all mammograms performed during the designated 10-day period in April 1999 was generated. Patients listed in the registry were stratified by exam type (screening versus diagnostic) and results (normal versus abnormal). Using the SPSS 9.0 random number function, equal numbers of patients from each stratum were randomly selected, and included on the telephone interview list. Interviewers called additional randomly selected names to replace women who could not be contacted after five attempts. Calls were made sequentially until the target of approximately 60 women who had received their mammogram results in each exam type/result category was reached. This provided the power to detect a difference between a 10% to 30% dissatisfaction rate with 80% power, and alpha of 0.05 in a two-tailed test of proportions.

Mammographic results were classified according to the Breast Imaging Reporting and Data Systems (BI-RADS).⁵ Normal results were defined as those requiring no further work-up (BI-RADS 1 and 2). Abnormal results included recommendation for additional mammographic views or ultrasound (BI-RADS 0); six-month follow-up (BI-RADS 3), or surgical consult or biopsy (BI-RADS 4 and 5).

Study End Points

The primary endpoint of the study was to measure the extent to which age, mammography result, time to getting results, anxiety about the results, and satisfaction with several components of communication (time spent communicating, clarity of explanation, comfort level, access, how well questions answered) were associated with ratings of overall satisfaction with the mammography results reporting process. For ease of interpretation in this report, dichotomous variables were created by dividing the satisfaction variables into dissatisfaction (satisfaction responses of poor and fair) and satisfaction (satisfaction responses of good, very good, and excellent). The secondary endpoints were recall rates of the mammogram results and recommendations and discordance rates between the patient-reported results and recommendations and the results and recommendations documented in the radiology report. The discordance rate was defined as the percentage of patients reporting results and recommendations that differed from those documented on the radiology report.

Statistical Analysis

Patients' dichotomized overall rating of (dis)satisfaction with results reporting were analyzed in separate logistic regression models for screening and diagnostic mammography. Variables included in the screening satisfaction model were age (younger than 65 vs 65 and older), normal (BI-RADS 1 and 2) vs abnormal (BI-RADS 0,3,4, and 5) result, the amount of time it took to get the

results (less than two weeks versus two weeks or greater), and anxiety about the results (none or moderate vs considerable or extreme). We also entered dichotomized dissatisfied/satisfied ratings of the clarity of results reporting, and the ability to get in touch with someone with questions about results. An additional regression model was performed with the same variables but with the amount of time it took to get results as a continuous variable. Variables included in the diagnostic mammogram satisfaction model were age, normal or abnormal mammogram result, anxiety level, and the dichotomized ratings of clarity of results reporting, amount of time spent communicating the results, comfort level in asking questions about the results, and perceptions of how well questions about the results were answered.

RESULTS

Interview Completion Rate

Nine hundred twenty one patients had either a screening or a diagnostic mammogram at the study site during the 10-day study period. Sixty-one patients signed the informational letter indicating their refusal to participate in the study, leaving 344 patients with diagnostic mammograms and 516 with screening mammograms as phone interview candidates. Among those sampled, very high rates of call completion (85%) were reported by interviewers and among those contacted, the phone refusal rate was less than 2%. A total of 148 (43%) of the 344 diagnostic mammogram patients, including 73/86 (85%) of patients with abnormal results and 75/258 (29%) of patients with normal results were successfully interviewed. One hundred fifty (29%) of 516 screening patients, including 61/128 (48%) of patients with abnormal results, and 89/388 (23%) of patients with normal results, were surveyed. Seventeen diagnostic exam patients had recommendations for surgical consults or biopsies.

There were no statistically significant differences in mean age (53 yrs vs. 52 yrs), race (unknown 20% both groups; white 62.9% vs 61.5%; African American 10.1% vs 11.1%; Latin American 4.7% vs 4.2%, and Asian 2.3% vs 3.2%) or percentage speaking English as first language (84% both groups) for the survey sample compared to the overall sample.

Survey Responses by Type of Mammogram

At the time of the interview, four weeks after the mammographic examination, 33 (37%) of the 89 surveyed women with normal screening exams reported that they had not yet received any results. Five (8%) of the surveyed patients with abnormal screening results reported not receiving any results within three weeks. One diagnostic exam patient also reported no results after two weeks. These 39 patients are thus not included in subsequent analyses of satisfaction with result reporting, which are based on 259 respondents.

Table 1 categorizes the responses of these 259 patients to survey items by mammogram exam type and result. Across the entire sample, only 41 patients (15.8%) rated overall satisfaction as fair or poor and 81 (31.3%) gave excellent ratings. Those who underwent screening exams were more likely to be dissatisfied with the way the results were reported than were those with diagnostic exams (20.2% vs 11.3%, $P = .05$). Among screening patients, compared with patients with normal results, the level of dissatisfaction was higher among patients with abnormal results.

Patients who had normal screening mammograms were less likely than those with abnormal screening mammograms to have received their results within two weeks of the exam (57% vs 33.9%, $P = .01$), which is an understatement given that over 30 normal screening patients reported not getting any results at all at four weeks. Despite the delay experienced by patients with normal screening exams, they were as likely as those who had abnormal screening exams to rate the time it took to receive their results as good to excellent. Patients who underwent abnormal screening mammograms were more likely than those with normal results to be dissatisfied with their ability to get in touch with someone to answer questions and were more likely to report considerable or extreme anxiety about their results.

Predictors of Overall Dissatisfaction with Test Results Reporting

Table 2 presents rates of dissatisfaction with both screening and diagnostic mammogram results reporting. Rates of overall dissatisfaction with mammogram results reporting and regression-adjusted odds ratios are presented for older patients, patients with a documented abnormal result, patients who reported considerable or extreme anxiety about results, and patients dissatisfied with specific aspects of test result reporting. For screening exam patients, Table 2 includes survey items on time to notification about results and ability to get in touch with someone to answer questions. For diagnostic exam patients, Table 2 presents three items measuring patients' dissatisfaction with direct contact with mammography center staff and physicians.

Table 2 indicates that, after adjustment for the other variables, among patients who had screening exams, age and whether the results were normal or abnormal were not associated with overall dissatisfaction with communication of results. However, considerable or extreme anxiety, over two weeks to notification, low ratings of how clearly results were explained, and the ability to get in touch with someone with questions, were all significantly associated with overall dissatisfaction with results reporting. When time to receipt of results was entered as a continuous variable, the odds ratio (OR) was 1.12 ($P = .01$) for each additional day of waiting (data not shown).

Among patients who had diagnostic mammograms, an abnormal result was associated with overall dissatisfaction

Table 1. Survey Responses by Exam Type and Result

	Normal Screening, % (n = 56)	Abnormal Screening, % (n = 56)	Normal Diagnostic, % (n = 74)	Abnormal Diagnostic, % (n = 73)
Overall satisfaction with the way results were communicated				
Poor to fair	17.9	26.8	9.5	12.3
Good to very good	62.5	51.8	48.6	50.7
Excellent	19.6	21.4	41.9	37.0
Age 65 or older	27.9	21.4	24.3	15.1
Anxiety level*				
Extreme	3.6	20.8	9.6	12.5
Considerable	3.6	12.5	16.4	15.3
Moderate	16.0	43.8	34.3	31.9
None	76.8	22.9	39.7	40.3
Rating of how clearly results explained				
Poor to fair	20.4	25.0	8.1	12.3
Good to very good	66.6	50.0	58.1	56.2
Excellent	13.0	25.0	33.8	31.5
Two weeks or more to notification*	57.1	33.9	—	—
Rating of amount of time to receive results				
Poor to fair	34.6	34.0	—	—
Good to very good	46.2	48.2	—	—
Excellent	19.2	17.8	—	—
Rating of ability to get in touch with someone to answer questions*				
Poor to fair	16.6	25.0	—	—
Good to very good	58.9	61.5	—	—
Excellent	24.5	13.5	—	—
Rating of comfort level in asking questions about the results				
Poor to fair	—	—	13.8	8.2
Good to very good	—	—	42.4	45.2
Excellent	—	—	43.8	46.6
Rating of amount of time staff or physicians spent communicating your results				
Poor to fair	—	—	13.8	13.7
Good to very good	—	—	54.8	56.1
Excellent	—	—	31.5	30.2
Rating of how well were questions answered				
Poor to fair	—	—	12.5	5.9
Good to very good	—	—	51.6	61.7
Excellent	—	—	35.9	32.4

*P ≤ .01 for comparisons between normal and abnormal screening mammogram patients.

but did not reach statistical significance. Age and anxiety level were not predictive of overall dissatisfaction for these patients. Low ratings of how clearly results were explained, comfort level in asking questions, and amount of time spent communicating results were all associated with overall dissatisfaction with result reporting; however, the rating of how well questions about results were answered was not.

Discordance Rates

Table 3 compares patient-reported results and follow-up recommendations and follow-up recommendations that appear in each patient's radiology reports. Discordance is defined as the percentage of patients in each radiology report category reporting a recommendation that

differed from those documented in their medical record. The percentage of patients in each category who were consistently unable to recall any recommendation was also reported.

Discordance rates were highest among the diagnostic mammogram patients with 21.6% of the patients with normal diagnostic mammograms reporting abnormal results and recommendations and 19.7% of the patients with abnormal diagnostic exams reporting normal results and routine follow-up recommendations. Rates of inability to recall recommendations were about 11% and 9% respectively for these patients. Four of 17 patients recommended for surgical consult or biopsy were discordant, but only one indicated normal follow-up and one other could not recall her recommendation. Although discordance rates were low among the screening mammography patients, 35.7% of

Table 2. Logistic Regression Results by Mammography Exam Type: Predictors of Overall Dissatisfaction with Communication of Results

Predictor Variables	Screening Patients Overall Dissatisfaction = 22% (25/112)			Diagnostic Patients Overall Dissatisfaction = 11% (16/147)		
	Dissatisfied, %	Adjusted Odds Ratio	P Value	Dissatisfied, %	Adjusted Odds Ratio	P Value
Age \geq 65	9 (2/22)	0.73	.73	14 (4/29)	2.43	.43
Abnormal result	27 (15/56)	0.69	.64	12 (9/73)	13.13	.06
Considerable or extreme anxiety	60 (12/20)	8.20	.02	15 (6/39)	0.97	.98
Fair to poor rating of how well results were explained	64 (16/25)	12.54	.0004	73 (11/15)	13.80	.01
Notification time of two weeks or more	27 (14/51)	6.58	.02	—	—	—
Fair to poor rating of ability to get in touch with someone to answer questions	75 (12/16)	11.97	.005	—	—	—
Fair to poor comfort level in asking questions about the results	—	—	—	69 (11/16)	23.83	.01
Fair to poor rating of how well questions were answered	—	—	—	75 (9/12)	4.26	.35
Fair to poor rating of amount of time spent communicating results	—	—	—	60 (12/20)	19.26	.007

these patients reported that they were unable to recall any follow-up recommendations.

DISCUSSION

This report improves our understanding of patients' satisfaction with mammography results reporting. Previous surveys of satisfaction with mammography have included information transfer as one of many components of satisfaction but have not addressed it in depth.^{1,6,7} Because they are such different populations and receive their mammography results by different methods, we analyzed the patients who had screening mammograms separately from those who had diagnostic mammograms.

For patients undergoing screening exams, longer waiting time for results, difficulty getting in touch with someone to answer questions, low ratings of how clearly results were explained, and considerable or extreme anxiety about the results were all associated with dissatisfaction with the way the results were reported. Although having abnormal results was associated with overall dissatisfaction in the univariate analyses, it did not remain significant after adjustment. For women undergoing diagnostic mammograms, low ratings of how clearly the results were explained, the time spent explaining the results, and the comfort level with asking questions were

associated with dissatisfaction; however, anxiety about results was not. Age and the mammography result were not significantly associated with overall satisfaction among screening or diagnostic mammogram patients. It is very relevant that for both the screening and the diagnostic mammogram patients, dissatisfaction with components of the communication process influenced overall satisfaction more than their actual result. This result was contrary to our a priori hypothesis that those with normal results would be more likely to be satisfied with the communication than were those with abnormal results.

For both screening and diagnostic mammograms, the perceived clarity with which results were explained was a significant determinant of overall satisfaction. Those who rated low levels of satisfaction with the clarity of explanations were 12–14 times more likely to be dissatisfied with communication of results overall. Our data show that in addition to its influence on overall satisfaction with results reporting, lack of clarity about explanations of results may have more serious ramifications. In this population, there was a low but substantial percentage of patients who either did not recall the follow-up recommendations at all or reported recommendations that were different from those reported in the radiology reports. While some of the discrepancies may have arisen because of differences in recommendations made by the referring physician, the finding that 23% of those with abnormal mammograms requiring further follow-up either did not recall their

Table 3. Concordance Between Patient-reported and Radiology Report Documentation of Results and Follow-up Recommendations*

Patient-Reported Recommended Follow-Up	Radiology Report				
	Diagnostic Exam Results			Screening Exam Results	
	Normal, n = 74	Abnormal, [†] n = 56	Surgical Consult or Biopsy Recommended, n = 17	Normal, n = 56	Abnormal, [†] n = 56
Normal mammogram in one year or at age 40, %	67.6	19.7	5.9	64.3	5.4
Surgical consult or biopsy, %	0	1.8	70.6	0	0
Abnormal, [†] %	21.6	69.6	17.6	0	89.2 [‡]
Did not recall any recommendation, %	10.8	8.9	5.9	35.7	5.4

* Does not include 38 screening exam patients (25.3%) and one diagnostic exam patient who reported not receiving any results or recommendations by the time of the interview.

[†] Abnormal results were classified from radiology reports as recommendations for another mammogram in six months or less, physician follow-up/clinical correlation, follow-up ultrasound or old films comparison.

[‡] Includes one concordant patient who was recommended for surgical consult/biopsy directly from screening mammogram.

follow-up recommendations or believed they could return to annual or routine screening, is a matter of concern, and in a few cases could have potentially serious clinical ramifications if reminder systems were not in place.

There are some limitations to this study. First, the survey was conducted among patients from a single, urban, academic mammography center. Our findings may not apply to smaller mammography centers or those centers with dramatically different result reporting procedures. Second, overall satisfaction with results reporting was high, suggesting that there may be a ceiling effect in the measurement of satisfaction, beyond which improvements in satisfaction may be difficult to measure. Third, this survey focused specifically on results reporting and did not address other components of satisfaction with mammography, such as waiting time for appointment or the discomfort of the exam, which may be indirectly affecting satisfaction with results reporting.

The results of this study suggest that the way mammography results and recommendations are communicated is more important than the actual results in determining satisfaction with results reporting. Of the components of result reporting, verbal clarity had significant impact on satisfaction with both screening and diagnostic mammogram results reporting. Therefore, interventions to improve the clarity with which mammography results are explained might be an important approach to improving satisfaction with mammogram results reporting. Furthermore, such interventions could have the additional benefit of decreasing patients' confusion about their mammogram results and follow-up recommendations. Written notification of results and follow-up⁸ as proposed in the Food and Drug Administration Quality Mammography Standards Act Final Rule, or

enhanced verbal communication of results with sensitivity to patients' medical literacy level and understanding, are potential strategies that deserve further consideration.

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